- \*\*Size\*\* - Factor takes a long position on firms with small market capitalizations and a short position on firms with large market capitalizations. The classification of small and large can be based on percentiles,quintiles or deciles. <br><br>

- \*\*Value\*\* - Factor takes a long position on firms with high book-to-market and a short position on firms with low book-to-market. <br><br>

- \*\*Profitability\*\* - Factor takes a long position on firms with high ratio of operating profit to book value and a short position on firms with low ratio of operating profit to book value.<br><br>

- \*\*Investment\*\* - Factor takes a long position on firms with conservative investment and a short position on firms aggresive investment. Investment is measured by the percentage change in the value of firms's asset over the course of a year.<br><br>

- \*\*Momentum\*\* - Factor takes a long position on stocks with large price appreciation in last one year and a short position on firms with price depriciation.<br><br>

**Barnstable**

* The college’s policy was to spend between 4% and 5% of the endowment each year.
* **philosophy**. In the long-run, the investment committee believed, stocks would outperform safer asset classes such as bonds and Treasury bills.
* S&P 500 index fund (40%), an actively-managed portfolio of U.S. stocks (30%), and an actively-managed portfolio of non-U.S. stocks (30%)
* **Mathematically**, the **law of large numbers** translates into the dispersion of returns growing only with the square root of time rather than proportionally with time.
* For **example**, the standard deviation of four-year returns is theoretically twice the standard deviation of one-year returns. On the other hand, the expected four-year return is four times the expected one-year return.2

### **FIRST** Proposal

* The securities firm was proposing that Barnstable College take advantage of the opportunity represented by the high put prices for the low probability risk that stocks would return less than 6% per annum over the long run.

### **SECOND** Proposal

* Creation of a trust or other suitable entity that, on the asset side, would own the stocks in the S&P 500, and on the liability side would have two classes of shares: Preference Shares and Common Shares.
* **Mechanism -** The trust would have a fixed life, say 30 years, during which the assets would be managed just like an S&P 500 index fund, including reinvestment of dividends. At the end of year 30, the trust would be liquidated, and the assets distributed to the liabilityholders as follows: Holders of Common Shares would receive any assets in excess of the “redemption value”, while holders of Preference Shares would receive the redemption value, or the value of the assets, whichever was less. The redemption value would be equal to the initial value of the assets in the trust grown at a 6% per annum continuously compounded rate for 30 years, or $1.0618430 = $6.05 for each dollar of initial assets.

**DFA**

**#**Fama French paper published:-

* Stocks with high “beta,” the fundamental measure of risk in the capital asset pricing model (CAPM), did not have consistently higher returns than low-beta stocks.

#**HML**

* Stocks with a high ratio of book value of equity to market value of equity (BE/ME) exhibited consistently higher returns than stocks with low BE/ME.
* The high book-to-market stocks favored by the strategy became known in the academic literature as “value” stocks while the low BE/ME stocks DFA eschewed became known as “growth” stocks, or sometimes as “glamour” stocks.

#**SMB**

* Consistent with the earlier findings of Banz, small stocks outperformed large.

#**Strategy**

* SMB and HML
* As word spread that DFA was willing to buy large blocks of illiquid stocks from eager sellers, calls and electronic inquiries began to pour in at a rate of hundreds per day. Of course, not all purchases could be made via block trade.
* Anyone who considers buying anything must be concerned with the adverse selection problem (sometimes known as the “lemons problem”)—the possibility that the item is only available for sale, or only available at the given price, because there is something wrong with it.
  + First, they generally would not buy if news announcements were known to be coming in the near future
  + Second, DFA would look to avoid stocks that were likely to negatively surprise in the near future

#**Challenges**

* the good performance of value stocks might simply have been a fluke or might have been due to problems with the data used by academic researchers.
* Value stocks, which had so reliably beaten growth stocks in previous decades in a variety of countries, rose steadily throughout the decade. But these steady returns were dwarfed by the spectacular performance of growth stocks, most especially high-technology stocks with very high market capitalizations and relatively few assets in place—the exact type of stocks DFA most studiously avoided